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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,898	01/22/2004	Adam William Saxler	5000.387	1897

21176 7590 09/07/2005

SUMMA & ALLAN, P.A.
11610 NORTH COMMUNITY HOUSE ROAD
SUITE 200
CHARLOTTE, NC 28277

EXAMINER

GHYKA, ALEXANDER G

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary

Application No.

10/707,898

Applicant(s)

SAXLER, ADAM WILLIAM

Examiner

Alexander G. Ghyska

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-77 is/are pending in the application.
- 4a) Of the above claim(s) 18-57 and 74-77 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 58-73 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

ALEXANDER GHYKA
PRIMARY EXAMINER

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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Claim 1 in the reply filed on June 22, 2005 is acknowledged. The traversal is on the ground(s) that the recitation of metal, boron nitride and diamond represent a reasonable number of species. This is not found persuasive because the term "metal" encompasses thousands of metal containing compounds .

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-17 and 58-73 are now under consideration, limited to the species of diamond as required by Claim 1, which was elected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-17 and 58-73 are rejected under 35 U.S.C. 102(e) as being anticipated by Ghyselen (US 6,867,067).

The present claims generally require adding a layer of diamond to a silicon carbide wafer to increase the thermal conductivity of the resulting composite wafer; thereafter reducing the thickness of the silicon carbide portion of the composite wafer while retaining sufficient thickness of silicon carbide to support epitaxial growth thereon; preparing the silicon carbide surface of the composite wafer for epitaxial growth thereon; and adding a Group III nitride epitaxial layer to the prepared silicon carbide face of the wafer.

Ghyselen et al disclose forming a zone of weakness beneath a surface of a source substrate to define a transfer layer; forming a bonding layer on the source substrate surface; forming a second bonding layer on a surface of the intermediate support; joining exposed surfaces of the first and second bonding layers to form a composite substrate; detaching the source substrate from the composite substrate along the zone of weakness to expose a surface of the transfer layer (the claimed thinning step), and depositing support material onto the exposed surface of the transfer layer. See column 18, line 50 to column 19, line 10. The zone of weakness can be formed by implanting ions. See column 5, lines 10-35. The transfer and support layers can contain combinations of silicon carbide and diamond. See column 19, lines 40-50. A useful layer can be deposited after deposition of the support material, and the useful layer can be of a material having a large bandgap such as aluminum nitride. See column 19, lines 20-30. The thick support can be formed directly onto the thin layer. See column 2, lines 60-70. The useful film can be formed by epitaxial growth. See

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column 5, lines 40-45. The silicon carbide can be up to 300 microns as required by the present claims. See column 7, lines 5-15. The thin layer can serve as a seed layer for growing the support layer. See column 7, lines 15-25. Ghyselen disclose rough polishing to form the rear support of the substrate and polishing the front of the substrate. See column 8, lines 15-35. Ghyselen et al discloses changing the polarity of the silicon carbide corresponding to the Si face or the C face. See column 9, lines 15-30. Therefore, the present Claims are anticipated by the disclosure of Ghyselen et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander G. Ghyka whose telephone number is (571) 272-1669. The examiner can normally be reached on Monday through Thursday during general business hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AGG
August 31, 2005

ALEXANDER GHYKA
PRIMARY EXAMINER

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